

Application No. 10/562,669
Amendment dated August 18, 2009
Reply to Office Action of May 7, 2009

Docket No.: 66967-0042

AMENDMENTS TO THE DRAWINGS

The attached sheet(s) of drawings includes the addition of FIG. 9.

Attachment: New Sheet Annotated

REMARKS

Applicants have carefully reviewed the Office Action mailed May 7, 2009, and thank Examiner Binda for his detailed review of the pending claims. In response to the Office Action, Applicants have amended claim 1, 21, 36 and 37 and canceled claims 26, 27 and 32 – 35. By way of this amendment, no new matter has been added. Accordingly, claims 1, 21 – 25, 28 – 31 and 36 – 53 remain pending in this application. At least for the reasons set forth below, Applicants respectfully traverse the foregoing rejections.

As Applicants' remarks with respect to the Examiner's rejections are sufficient to overcome these rejections, Applicants' silence as to assertions by the Examiner in the Office Action or certain requirements that may be applicable to such rejections (e.g., whether a reference constitutes prior art, motivation to combine references, assertions as to dependent claims, etc.) is not a concession by Applicants that such assertions are accurate or such requirements have been met, and Applicants reserve the right to analyze and dispute such assertions/requirements in the future. Further, for any instances in which the Examiner took Official Notice in the Office Action, Applicants expressly do not acquiesce to the taking of Official Notice, and respectfully request that the Examiner provide an affidavit to support the Official Notice taken in the next Office Action, as required by 37 CFR 1.104(d)(2) and MPEP § 2144.03. Applicants respectfully request reconsideration of the present application in view of the above amendment and the following remarks.

Drawings

The drawings were objected as failing to show the limitations of claims 42 – 45, 52 and 53. Applicants traverse this objection. Without conceding that the Examiner had a proper basis for objection and in an effort to expedite prosecution of this application, Applicants have added new FIG. 9 to further clarify the overall placement of the components from FIGS. 1 – 8 in a motor vehicle drivetrain generally at 54. One can see the two side shafts 40 of the rear axle of the vehicle, each side shaft 40 having one constant velocity joint 11 on each side. The inventive joint 11 can also be used in the front side shafts 40 or in the propeller/driveshafts 55. Thus, one of skill in the art will understand that the objected claim limitations of claims 42 – 45,

52 and 53 are included in both the previously submitted FIGS. 1 – 8 and in newly added FIG. 9. Therefore, withdrawal of this objection is respectfully requested.

Specification

Title

The title of the invention was objected to for including the word “optimized.” Applicants traverse this objection. Without conceding that the Examiner had a proper basis for objection and in an effort to expedite prosecution of this application, Applicants have amended the title, removing the word “optimized.”

Figure 9

Applicants have added paragraph [0039.1] to correspond with the addition of FIG. 9 to address the Examiner’s drawing objection. Additionally, Applicants have amended paragraphs [0044] thru [0047] to include reference to FIG. 9, as well as adding item numbers 40, 54 and 55 to clarify FIG. 9. These additions merely clarify previously presented components in the specification as they relate to a motor vehicle.

Accordingly, it is believed that the Examiner’s objection has been addressed. Therefore, withdrawal of this objection is respectfully requested.

Claim Rejections – 35 U.S.C. § 112

Claims 1 and 21-53 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner has rejected claims 1 and 21 as having insufficient antecedent basis. To address the Examiner’s rejection, Applicants have amended Claims 1 and 21. More specifically, Applicants have amended these claims to include “a central joint plane (E)” and “a shaft toothing” removing “the central joint plane (E)” and “the shaft toothing.” These amendments were made for consistency and to further clarify the claim scope. Applicants respectfully request withdrawal of this rejection.

Claim Rejections – 35 U.S.C. § 103

The Office Action rejected Claims 1, 21-29, 34, 35, 38, 39, 46, and 47 under 35 U.S.C. § 103(a) as being unpatentable over Aucktor (U.S. Patent No. 3,475,924) (hereinafter Aucktor). Claims 1, 21-29, and 34-37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Krude et al. (U.S. Publication No. 2001/0006910) (hereinafter Krude). Claims 1, 21-47, and 50-53 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sahashi et al. (U.S. Publication No. 2001/0004611) (hereinafter Sahashi) in view of Krude. Claims 1, 21-29, 38-41, and 46-53 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cermak et al. (U.S. Patent No. 6,379,255) (hereinafter Cermak) in view of Krude. These rejections are respectfully traversed.

Applicants assert that claims 1 and 21 are non-obvious in view of the prior art references, Aucktor, Krude, Sahashi and Cermak. However, without conceding that the Examiner had a proper basis for rejection and in an effort to expedite prosecution of this application, Applicants have amended claims 1 and 21 to include the limitations of claims 34 and 35, as originally filed, to further define over the prior art references.

More specifically, all of the cited references (Aucktor, Krude, Sahashi and Cermak) are silent with respect to the maximum articulation angles of the joints disclosed therein. Claims 1 and 21 have been amended to incorporate the limitations, “wherein the joint is designed to have a maximum angle of articulation ranging between 30° and 40°.” This newly added limitation according to which the maximum articulation angle ranges between 30° and 40° is relatively small for a fixed type constant velocity joint and thus differs significantly from the fixed type constant velocity joints shown in the cited references.

Aucktor

Applicants note that the Examiner concedes that Aucktor “does not expressly disclose ratios V1, V2, V3 & V4 and maximum angle of articulation having values within the ranges recited in the instant claims.” *See Office Action page 4, lines 12 – 13.* However, the Examiner asserts, without any reference to the prior art, that it would have been obvious for a person of ordinary skill in the art

to have the values within the claimed ratios for V1 (claim 1) and V3 (claim 21), as it would only involve routine skill. *See Office Action page 4, lines 13 – 16.* Applicants disagree.

Aucktor neither teaches nor suggests, “wherein, when the joint is in the aligned condition, the following condition is satisfied: $0.9 < V1 < 1.3$ with $V1 = \text{PCDS}^3 / \{\text{DK}^2 \times \text{PCDB}\}$ where PCDS is the pitch circle diameter of a shaft toothing in the inner joint part, DK is the ball diameter, and PCDB is the pitch circle diameter of the balls,” or “wherein, when the joint is aligned, the following is satisfied: $0.34 < V3 < 0.37$ with $V3 = \text{PCDS} / (\text{PCDB} + \text{DK})$ where PCDS is the pitch circle diameter of a shaft toothing in the inner joint part, PCDB is the pitch circle diameter PCDB of the balls, and DK is the ball diameter,” as claimed by Applicants’ independent claims 1 and 21, respectively.

Further, Aucktor, as recited above, neither teaches nor suggests, “wherein the joint is designed to have a maximum angle of articulation ranging between 30° and 40° ,” as claimed by amended independent claims 1 and 21. Instead, Aucktor teaches a joint for use in the side shafts, (*See col. 5, lines 12 – 18 and FIG. 7*) which side shaft joints have a maximum articulation angle of far less than 20° . Therefore, Aucktor cannot have an articulation angle ranging between 30° and 40° , as claimed by Applicants’ independent claims 1 and 21. Therefore, Aucktor fails to teach every recitation of independent claims 1 and 21, as required in *In re Royka*. Withdrawal of the rejection is respectfully requested.

Krude

The Examiner concedes that “Krude does not expressly disclose ratios V1, V2, V3 and V4 and maximum angle of articulation having values within the ranges recited in the instant claims.” *See Office Action page 5, lines 15 – 16.* However, the Examiner asserts, without any reference to the prior art, that it would have been obvious for a person of ordinary skill in the art to have the values within the claimed ratios for V1 (claim 1) and V3 (claim 21), as it would only involve routine skill. *See Office Action page 5, lines 16 – 19.* Applicants disagree.

Krude, as recited above, neither teaches nor suggests, “wherein, when the joint is in the aligned condition, the following condition is satisfied: $0.9 < V1 < 1.3$ with $V1 = PCDS^3 / \{DK^2 \times PCDB\}$ where PCDS is the pitch circle diameter of a shaft toothing in the inner joint part, DK is the ball diameter, and PCDB is the pitch circle diameter of the balls,” or “wherein, when the joint is aligned, the following is satisfied: $0.34 < V3 < 0.37$ with $V3 = PCDS / (PCDB + DK)$ where PCDS is the pitch circle diameter of a shaft toothing in the inner joint part, PCDB is the pitch circle diameter PCDB of the balls, and DK is the ball diameter,” as claimed by Applicants’ independent claims 1 and 21, respectively.

Further, Krude neither teaches nor suggests, “wherein the joint is designed to have a maximum angle of articulation ranging between 30° and 40°,” as claimed by independent claims 1 and 21. Instead, Krude is silent to a range of maximum articulation and teaches providing a joint which, while making optimum use of the material used for the enclosure of the balls by the ball tracks in the outer joint part at the track end, offers a greater degree of design freedom in respect of ball sizes and the axial extension of the guiding face while providing more advantageous assembly conditions. This “optimum use of material used for the enclosure of the balls” which “offers a greater degree of design freedom” is not nor does it imply a “maximum angle of articulation ranging between 30° and 40°,” as claimed by Applicants’ claims 1 and 21.

Therefore, Krude fails to teach every recitation of independent claims 1 and 21, as required in *In re Royka*. Withdrawal of the rejection is respectfully requested.

Sahashi in view of Krude

The Examiner recites that it would have been obvious to one of ordinary skill in the art to modify the driveshaft of Sahashi by making the joint in a manner similar to that of Krude. Applicants disagree.

The Sahashi reference clearly states that it is said to be optimized with regard to torque capacity and size, according to paragraphs [0050] and [0051]. However, if the respective values for PCDS (pitch circle diameter of the shaft toothing of the inner joint part, corresponding to PCD_{SERR}

of Sahashi), DK (corresponding to Dball of Sahashi) and PCDB (corresponding to 2 x PCR of Sahashi) are measured from the drawing figures 7A and 78 of the Sahashi reference, one can calculate the following values for V1 and V3 (approximately): $V1 = 1.88$ and $V3 = 0.40$. These values do not compare to and are unlike the claimed values of claims 1 and 21, according to which V1 should be within a range of 0.9 to 1.3, and V3 should be within a ranged between 0.34 and 0.37. Thus, if one of skill in the art would have followed the Sahashi reference, he would never arrive at the inventive constant velocity joint as disclosed and claimed by Applicant's independent claims 1 and 21. Further, Sahashi neither teaches nor suggests, "wherein the joint is designed to have a maximum angle of articulation ranging between 30° and 40°," as claimed by independent claims 1 and 21.

Further, Krude fails to make up for the deficiencies of Sahashi as the remarks presented above, with respect to the Krude rejection, are equally applicable here. Specifically, Krude neither teaches nor suggests, "wherein the joint is designed to have a maximum angle of articulation ranging between 30° and 40°," as claimed by independent claims 1 and 21. Therefore, neither Sahashi, nor Krude teach every recitation of claims 1 or 21, as required in *In re Royka*. Withdrawal of the rejection is respectfully requested.

Cermak in view of Krude

Applicants note that the Examiner asserts that Cermak shows a driveshaft comprising two constant velocity joints connected to intermediate shafts but does not expressly show one of the joints comprising all the limitations of claims 1 and 21. *See Office Action page 6, lines 16 – 18*. Further, the Examiner recites, without any reference to the prior art, that it would have been obvious for a person of ordinary skill in the art to make a driveshaft having such joints. Applicants disagree.

Cermak does disclose a driveshaft assembly having joints at each end. However, Cermak is silent to the use of a joint wherein the joint is designed to have a maximum angle of articulation ranging between 30° and 40°," as claimed by independent claims 1 and 21. Cermak further discloses a drive assembly which, if a maximum axial force is exceeded, permits the one shaft portion to enter the other shaft portion in a force-free way, with uncontrolled buckling and bending

of the divided shaft in the region of the joint connecting the two shaft portions being avoided. *See paragraphs [0006] thru [0017]*. Therefore, the Examiner is incorrect in his assumption that it would have been obvious to substitute the joints of the present application with the joints of Cermark's driveshaft as one looking to compress a driveshaft into itself in a straight line would not use a joint "designed to have a maximum angle of articulation ranging between 30° and 40°," as claimed by independent claims 1 and 21. By using such a joint with the driveshaft of Cermark would cause the driveshaft to buckle in multiple directions, thus defeating the intent of Cermark's invention. Therefore, using Applicants' joint teaches away from Cermark's invention intent.

Further, Krude fails to make up for the deficiencies of Cermark as the remarks presented above, with respect to the Krude rejection, are equally applicable here. Specifically, Krude neither teaches nor suggests, "wherein the joint is designed to have a maximum angle of articulation ranging between 30° and 40°," as claimed by independent claims 1 and 21. Therefore, neither Cermark, nor Krude teach every recitation of claims 1 or 21, as required in *In re Royka*. Withdrawal of the rejection is respectfully requested.

It is respectfully submitted that none of the applied art, alone or in combination, teaches or suggests the features of claims 1 or 21 that now includes the amended features as discussed above. Nor has the Examiner provided any motivation for combining these prior art references.

Further, as discussed above, the newly added feature referring to the maximum angle of articulation in combination with the claimed values for V1 (claim 1), respectively V3 (claim 21) together leads to a technical advantage over the prior art, namely that the joint has, at a given torque transmitting capacity, a minimum radial building space. *See at least paragraphs [0006] and [0016]*. This again leads to a lower weight of the joint and thus to a reduced fuel consumption of the vehicle equipped with one or more of the inventive joints. The inventive joint is specifically well suitable for the side shafts of a motor vehicle, i. e., for drivingly connecting the differential output and the wheel hub. Accordingly, it is believed that claims 1 and 21 are in a condition for allowance. Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

Dependent claims 22 – 25, 28 – 31 and 36 – 53 teach independently patentable subject matter, although they are patentable merely by being dependent on an allowable base claim. For example, claims 42 and 43 recite that the claimed joint is used as a differential-side fixed joint in such a side shaft. However, Aucktor, column 5, lines 12 to 18, and Figure 7, discloses that plunging type joints (J) are used in the side shafts, which have a maximum articulation angle of far less than 20°. Even further, Sahashi, Figures 2, 3, 5 and 9, teaches that it is common to use plunging type joints on the differential side of a side shaft. Thus, both Auctor and Sahashi teach away with regard to claims 42 and 43. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection.

Conclusion

In view of the above amendment and remarks, the pending application is in condition for allowance. If, however, there are any outstanding issues that can be resolved by telephone conference, the Examiner is earnestly encouraged to telephone the undersigned representative.

It is believed no fees are due with this response. However, if any fees are required in connection with the filing of this paper that are not identified in any accompanying transmittal, permission is given to charge our Deposit Account No. 18-0013, under Order No. 66967-0042 from which the undersigned is authorized to draw. To the extent necessary, a petition for extension of time under 37 C.F.R. §1.136 is hereby made, the fee for which should also be charged to this Deposit Account.

Dated: April 18, 2009

Respectfully submitted,

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Attachments

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REPLACEMENT SHEET